

Ingegerd Annergren



Scania: Materials science and academic collaborations from a large business perspective





contents

01 Scania purpose

02 Scania and sustainability

03 Electrifying

04 Materials impact CO2

05 Steels

06 Metals in powertrain

07 Electric machine

08 Polymers

09 End

OUR PURPOSE

Scania's purpose is to drive the shift towards a sustainable transport system, creating a world of mobility that is better for business, society and the environment.

Products



Buses



Power solutions



Services



Financial services

Trucks



TRANSPORT eco-system is transforming



GLOBAL TRENDS



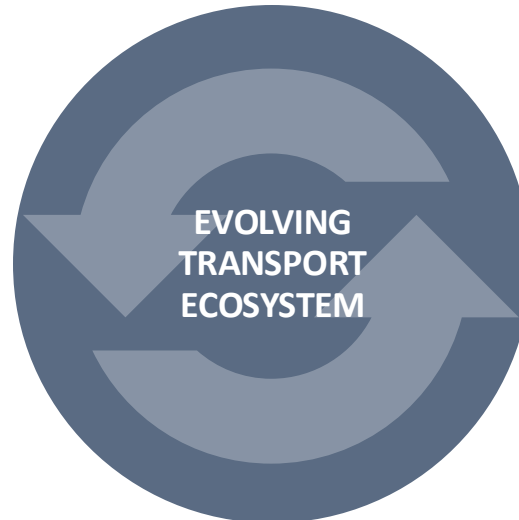
URBANISATION



SUSTAINABILITY



DIGITALISATION



INDUSTRY TRENDS

CONNECTIVITY



ELECTRIFICATION



AUTOMATION



CUSTOMERS

PRODUCTS & SERVICES

COMPETITION

SCANIA

The transport INDUSTRY is changing

WE ARE DRIVING THE SHIFT

A society striving for sustainability

Need for transports is increasing

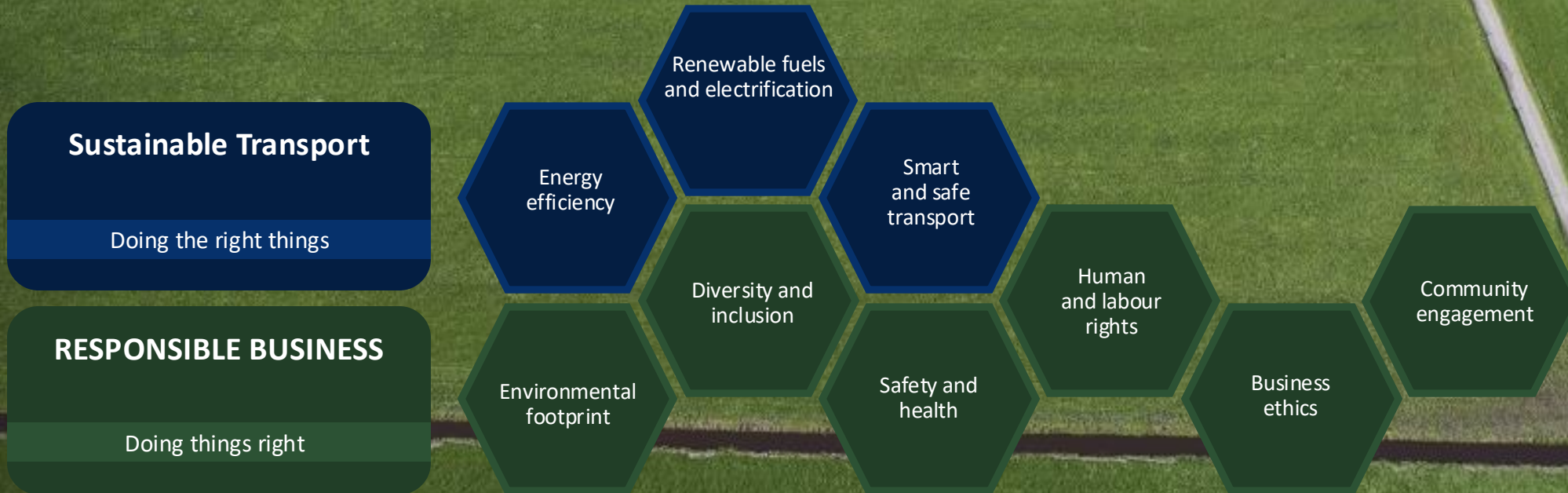
25% of global emissions from transports

Transports key to economic and social sustainability





Sustainability at Scania





ELECTRIFICATION

50%

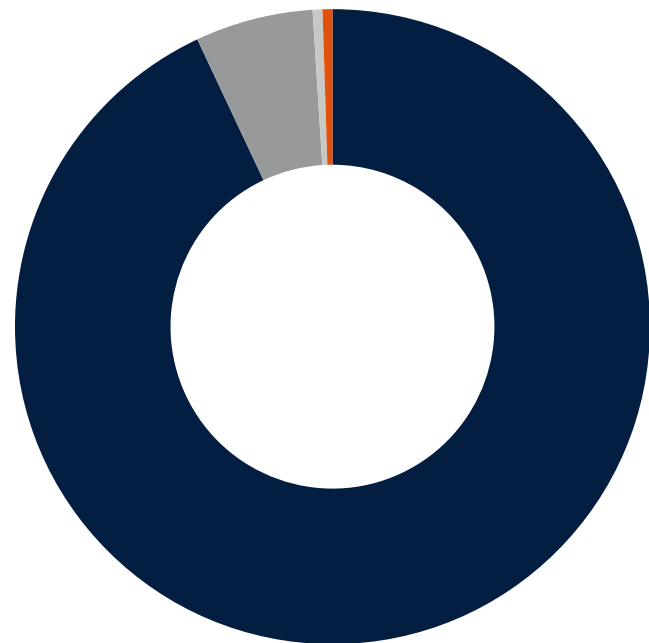
By 2030, more than half of our new vehicles sales volume is expected to come from electrically powered vehicles.



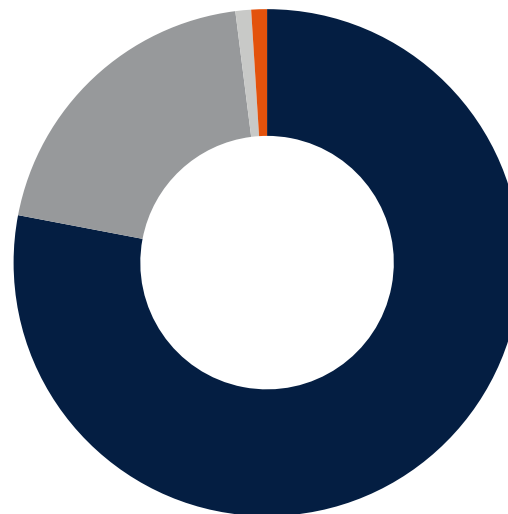


Our CO2 impact stems mainly from our products' use phase – but will change in the future

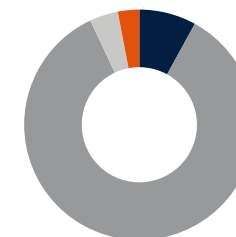
Combustion engine



BEV
(electricity mix)



BEV
(green electricity)



■ Use ■ Production ■ Maintenance ■ Recovery



Source: Scania Life Cycle Assessment, 2020

18%
Steel¹

1%
Textiles

1%
Copper

1%
Other²

The Majority of CO₂ emissions come from the battery

% CO₂ emissions for BEV XXXX

3% Plastics

Total:

xx CO₂

69% battery

2% Rubber

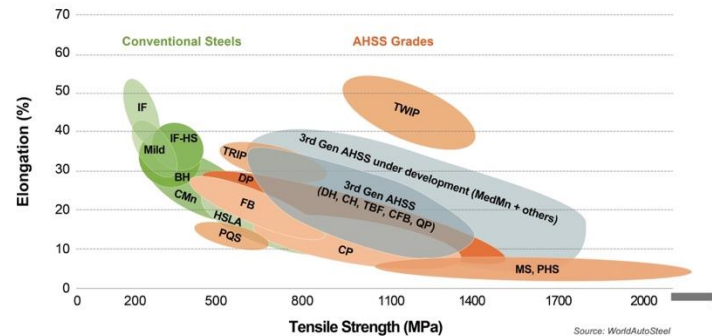
5% Aluminum

1. Including iron; 2. Electronics, glass, other metals, paint; 3. Scania 20xx battery emissions

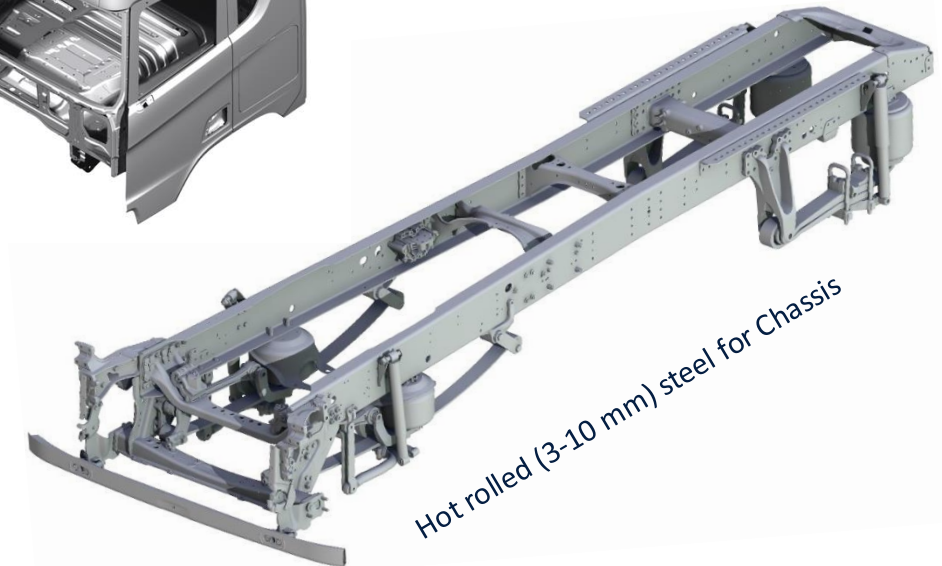
Structural steel



Important properties are: Fatigue strength, energy absorption, formability, corrosion, weldability and visual appearance.



Cold rolled (0.8-2.5mm) steel for cab.



Improved strength/weight and sustainability by:

- Increased fatigue strength and energy absorption
- Improved formability by state of the art forming technologies
- Introduction Advanced High Strength Steels (AHSS) including hot rolled AHSS
- Introduction of fossil free steel



Metals in the powertrain

ICE;
bio fuels, gas, H2 (durability in the fuel system)



Sustainable steels and processes: increased use of low pressure carburising, nitriding processes. Increased recyclability

BEV;
Cell-module-pack
(breakdown mechanisms, skipping module stage)

Aluminium
+100%

Copper
+360%



- Al High pressure die casting
- Al recyclability



Electric Machine

Stator, rotor, magnets, windings, isolation, electrical contacts!

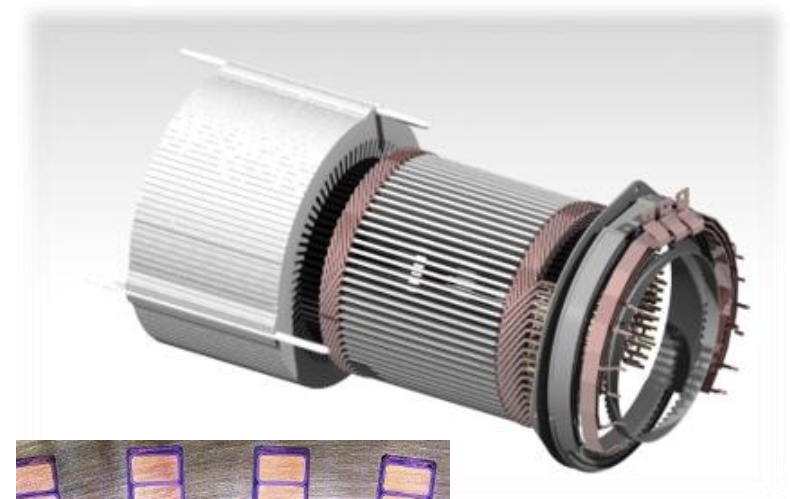
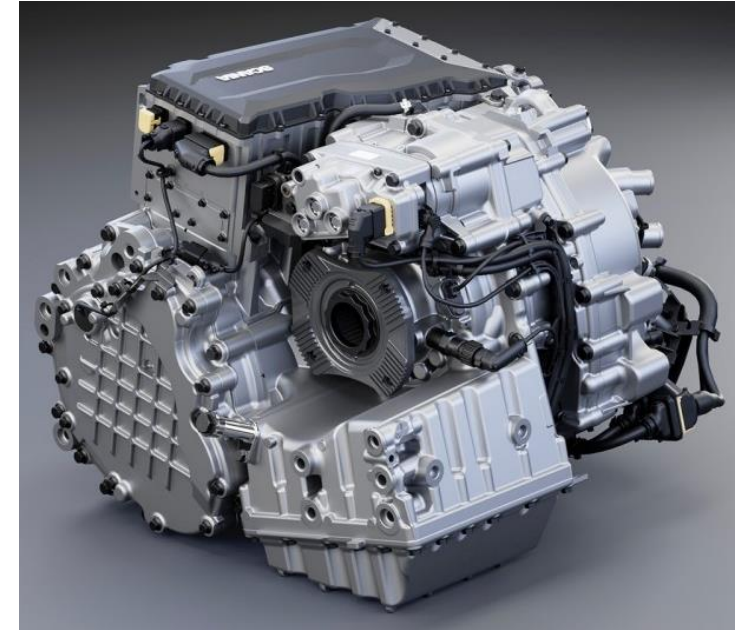
Copper winding- Hairpin or continuous winding Bending properties: welding, isolation properties, what kind of oil, cooling properties, fill factor

Future hollow windings, AM technologies



Challenges:

- durability and losses in contacts
- technical cleanliness



Polymers



Commonly thermoplastic injection moulded parts but also other production methods. Thermoplastics and thermosets are used in various applications

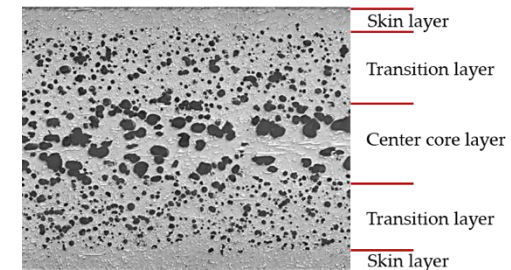


Challenges:

- Circularity and Decarbonisation
- Polymers adapted for electrification
- More complex systems with multifunctions (conductive/insulation, flexible/rigid)

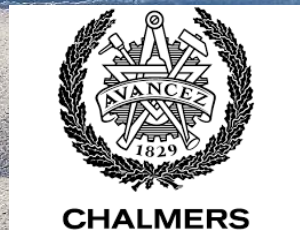
Microcellular injection moulding: KuFizz

Nitrogen gas is mixed with polymer melt in the injection moulding process
Weight reduction up to 30% and cost reduction 10%





Towards Net zero emission!



Thank you for your attention!



SCANIA

Ingegerd Annergren